IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A barrier structure for copper metallization, comprising:
a dielectric pattern disposed directly on an upper surface of a substrate;
a first Ru layer disposed directly on an upper surface of the dielectric pattern;
an oxide film disposed directly on an upper surface of the first Ru layer;
a second Ru layer disposed directly on an upper surface of the oxide film; and
a Cu layer disposed directly on an upper surface of the second Ru layer,
wherein the oxide film is made of RuxOy formed by a plasma treatment using N_2O or O_2.

2. (Previously Presented) The barrier structure of claim 1, wherein the substrate is a silicon substrate.

3. (Previously Presented) The barrier structure of claim 1, wherein the first Ru layer and the second Ru layer are formed by using a sputtering or CVD (chemical vapor deposition) and the first Ru layer has a thickness in a range from about 80 angstroms to about 120 angstroms.

4. (Cancelled).

5. (Currently Amended) The barrier structure of claim [[4]] 1, wherein the thickness of the oxide film is about 250 angstroms, which is obtained by oxidizing an upper part of the first Ru layer.

6. (Currently Amended) The barrier structure of claim [[4]] 1, wherein the ratio of x:y = 1:2.

7. – 12. (Cancelled).

13. (Previously Presented) The barrier structure of claim 1, wherein the first Ru layer, the oxide film and the second Ru layer collectively form a conductive barrier structure for the Cu layer.

14. (Cancelled).

15. (New) A barrier structure for copper metallization structure, comprising:
a Cu layer disposed on a substrate;
a dielectric pattern disposed between the substrate and the Cu layer;
a first Ru layer disposed between the dielectric pattern and the Cu layer;
an oxide film disposed between the first RU layer and the Cu layer; and
a second Ru layer disposed between the oxide film and the Cu layer,
wherein the oxide film is made of RuxOy.

16. (New) The barrier structure of claim 15, wherein the ratio of x:y = 1:2.